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Northern Goshawk Module
for the
Timberland Planning Component

California Department of Fish and Game
Northern California – North Coast Region
Interior Timberland Planning Team

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Resource Issue

The northern goshawk (*Accipiter gentilis*) is a Department of Fish and Game (DFG) species of special concern and a Board of Forestry sensitive species. Although known goshawk territories span a variety of habitat types, many researchers have associated core areas around nests and the post-fledgling area with more of mature forest conditions (e.g. higher canopy cover and larger trees) than the surrounding area (Hall 1984, Spieser and Bosakowski 1987, Woodbridge and Detrich 1994, Squires and Ruggiero 1996, Desimone 1997, McGrath 1997, Farber et al. 1998). Due to the species' ambush technique for hunting, goshawk foraging habitat is associated with closed canopy forest and its edges (Bosakowski 1999). At the landscape scale, a diverse mosaic of all forest seral stages, non-forest vegetation and habitat elements (e.g., snags, herbaceous plants) may provide optimal habitat for goshawk prey species (Reynolds et al. 1992).

The Forest Practice Rules (FPRs) specify protection measures to a maximum of 20 acres around currently active nests. On the other hand, there is a biological basis for considering the need for protection measures at a larger scale than the 20 acres around a single nest (see Goshawk Review Module). However, this biological basis lacks sufficient scientific information for determining the risk thresholds for nesting goshawks and dispersing juveniles within the 20 to 500 acres surrounding nests. Similarly, the cumulative biological effects of habitat modification on goshawk foraging at the even larger home range scale is unclear. The purpose of this module is to outline a general plan for using regionally focused scientific information on goshawks to shift towards landscape-scale approaches for protecting this species.

Goals

- Maintain viable populations of goshawks within the broad areas of forestland where private timberlands constitute a substantial portion of the landbase
- Develop goshawk protection and habitat conservation approaches that are landscape-focused and more effective than the FPRs

Objectives

- Undertake GIS-based statistical analyses that explore the link between (1) habitat conditions, (2) forest management effects, (3) the viability of goshawk territories (e.g. sustained occupancy and reproductive success), and (4) stable population dynamics at the landscape scale.
- Develop a framework for introducing flexible guidelines for protecting individual goshawk territories during the THP process, and allow for these guidelines to be regularly modified based on new information developed through cooperative DFG-timber company research.
- When the pre-requisite research questions have been answered, craft protection strategies that shift focus to maintaining stable populations on, or across, ownerships.
- Monitor the implementation of protection measures and strategies (and subsequent territory or population status) in order to track the effectiveness of these protection measures and strategies.
- Maintain a cooperative research process characterized by open, honest, constructive and regular communication that is capable of adapting policy based on new information and reasonableness with respect to the goals and objectives listed above.

Strategic Plan

In March 2001, the Interior Timberland Planning Team (Team) (and other DFG functions) met with representatives from several timber companies and a forestry consultant to initiate a cooperative project for assessing goshawk habitat use and impacts. The group drafted a study design for determining at what scale habitat use is occurring for successfully reproducing goshawks on private timberlands in interior northern and central California. This analysis will use statistical methods and WHR habitat typing to determine the size of the circle around nests that remains significantly different from the surrounding landscape. It is hypothesized that this core area may provide special conditions for nesting and post-fledgling habitat. A subset of the original group is taking the analysis a step further by introducing forest inventory plot data. Once completed, the information could be used to describe the range of variability in habitat metrics (e.g., average tree diameter, canopy closure, density of trees or snags above threshold diameters, etc.) within a critically sensitive area. The information could also be used to develop a model (e.g., fuzzy logic, logistic regression) for predicting the availability of suitable goshawk habitat on the landscape.

Because of the lengthy timeframe for completing the analysis discussed above, the Team is undertaking a simpler parallel analysis (see Goshawk Review Module) utilizing 1994 Landsat WHR habitat mapping and the Ncal-gos database (Woodbridge 2001). The latter database includes the most comprehensive data set currently available on the locations of known goshawk nests and their activity histories. Statistical comparisons

with random points will be made and the results of the analysis will be stratified by eco-region or forest type. The Team is soliciting input and review of its analysis methodology and results from the participants of the cooperative group discussed in the previous paragraph. The purpose of the DFG analysis is to provide an interim biological basis for use in determining when protection measures beyond FPR 20-acre buffers are necessary to reduce the risk of significant adverse impacts. The need for protection measures in some cases beyond a single 20-acre buffer does not mean that the Team would always be recommending buffers greater than 20 acres in size. Such protections measures could include multiple buffers less than 20 acres in size around alternate nesting sites, or some adjustment of proposed silviculture outside of a single buffer. The biological basis and guidelines for protection measures will be amended to the Team's Goshawk Review Module. As additional analyses are completed through the cooperative effort between the Team and timber companies, the biological basis, guidelines for protection measures and Goshawk Review Module will be revised accordingly to meet the goals and objectives stated earlier in this document. For example, information about the significance of habitat scale around nests could be used to supplant the current focus in the Goshawk Review Module on 125 acres.

Monitoring

Monitoring will be an essential part of achieving the goals and demonstrating success of this Goshawk Planning Module. DFG will devote staff resources to a variety of cooperative monitoring efforts in order to refine the implementation of survey methods and to track the effectiveness of protection measures and strategies. A formal experimental monitoring design may be necessary to test effectiveness. The Team will also ask timber companies to devote resources to the monitoring effort.

Adaptive Management

Cooperative research and monitoring findings will be used to revise and update approaches to protections measures and strategies. The criteria for making changes will be the goals and objectives of this module as listed above. In keeping with a "no-surprise" working environment, open, honest, constructive and regular communication will be maintained between the Team and timber companies and other engaged stakeholders.

Measures of Success

Success will be measured by the extent to which the following are met:

- Completion and review of a GIS-based statistical analyses that increase knowledge of goshawk habitat requirements and risk thresholds.
- Development of credible and flexible guidelines for more effectively protecting individual goshawk territories through the THP process.
- Development and implementation of landscape approaches for maintaining stable goshawk populations on and around private timberlands.

- Development and implementation and effectiveness monitoring programs that provide information for validating or adapting guidelines and landscape approaches to goshawk protection.
- Cultivation and maintenance of a cooperative and scientifically focused research process for goshawk involving agency and industry staff.

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